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REPORT ON THE EFFECTIVENESS OF REGIONAL AND SUBREGIONAL DEVELOPMENT PROJECTS IN THE AGRICULTURAL AND RURAL SECTOR, WITH PARTICULAR EMPHASIS ON ENVIRONMENT AND SUSTAINED DEVELOPMENT

INTRODUCTION

1. The agricultural and rural sector is very important in Africa and enormous efforts have been made to develop it, not only at the national level, but also at the regional and subregional level. However, despite this, the growth of the sector has not kept pace with population growth: according to FAO, the population is increasing by 3.3 per cent per year, but agricultural output by only 1.5 per cent per year. This situation is very worrying and threatens to undermine any lasting development in the long-term, because all these factors tend to lead to a running-down of the natural resources and productive capacity of the continent.

2. Africa must now address itself to reversing these trends and establishing agricultural and rural development projects which are more efficient and are able to feed a fast-growing population without damaging the ecological environment. This means that any agricultural and rural development project should be analyzed in terms of whether it yields enough agricultural output and helps to conserve the natural resources of the continent. This is the only way to guarantee sustained development.

3. Indeed, for development to be sustainable, it is necessary, according to the FAO definition, to manage and conserve natural resources and guide technical and institutional changes in such a way as to satisfy the needs of present and future generations. In other words, in the sectors of agriculture, forestry and fisheries, land, water, fauna and flora must be preserved and husbanded in ways which will not endanger the environment and are technically suitable, economically viable and socially acceptable.

4. In this spirit, it is necessary to establish, or use all means to promote projects which are more compatible with sustained development and environment friendly.

5. It should be noted here that such projects:

(a) Must have both regional, subregional and national dimensions and their effectiveness will depend on the role played by the actual participants who, as this is Africa, will for the most part be living in rural areas;

(b) Can be environment-friendly and contribute to lasting African development only if they genuinely further rural development as a whole and allow the communities concerned to participate.

6. At issue are the extent to which communities are likely to participate in the design, execution and evaluation of the projects and to share the benefits; the extent to which such projects will improve their situation and how the projects will help to increase their capacity to embark on a sustained and lasting process of development that respects the environment.

7. In fact, many of the projects designed and implemented in the recent past have not taken full account of these concerns. The present report analyzes fundamental aspects which have been overlooked since the design and implementation of such projects in Africa and rightly makes suggestions for improving their effectiveness.

8. It is for this reason that the report insists on the need for a suitable policy framework and improved project-studies which will take account of potential local markets as well as markets abroad; on the strengthening of linkages between projects and related programmes and other sectors; on better and more efficient management, made possible by the participation of interested groups, improved administrative apparatus and genuine support from the government; and on the protection both of the environment and of rural communities.

9. Above all, this report is addressed to funding agencies and planners (or African decision-makers) generally responsible for the design and preparation of agricultural development projects. In addition, as it forms an integral part of a number of activities in the work programme of the Joint ECA/FAO Agriculture

Division of ECA [sub-programme 3(b)(i), for the 1992-1993 biennium], it will be submitted to the Conference of African Ministers of Planning, the supreme policy organ of ECA, for information and appropriate action.

10. Finally, this report is built around the following two major chapters:

(a) The inadequacies of the orthodox framework of agricultural project design, implementation and evaluation. This chapter is based on a critical look at specific national, regional and subregional projects which were designed and implemented in various parts of the African continent;

(b) The possibilities of improving project-efficiency in the area of regional and subregional development in the agricultural and rural sector, with particular emphasis on the environment and sustainable development.

I. THE INADEQUACIES OF THE ORTHODOX FRAMEWORK FOR PROJECT DESIGN IMPLEMENTATION AND EVALUATION IN AFRICA

A. Overview of the framework (fundamental concepts and aspects which have been overlooked)

1. Project design

11. In general terms, an agricultural development project should be seen as a planned undertaking made up of a series of interdependent and coordinated activities aimed at achieving certain specific objectives within the framework of a socio-economic and ecological environment and a given budget and time-frame.

12. The manner in which the projects are planned and executed should, logically be sequenced as follows (1):

13. The first stage consists of identifying projects having the "potential" to be financed by funding agencies. In this context, regional and subregional groupings or intergovernmental organizations (IGOs), together with funding agencies are usually the source of such projects. The aim of this identification stage is to justify a project and in principle, it should take account of the long-term economic and social plans for the country concerned, as well as focus on a specific sector and on macroeconomic conditions. Unfortunately, in this case, the project does not always complement an existing related programme or an overall development programme, when considered against a well-defined policy framework.

14. Once the project has been identified, a mechanism for planning and formulation can begin to be put in place to study all aspects and to draw up a project document for submission to the funding agencies (2). Normally, the project should be prepared by a team of specialists called together for this purpose and provided with sufficient information and resources for such an exercise. However, this could also be done by a firm of consultants or a technical assistance organization such as the Investment Centre of the Food and Agriculture Organization of the United Nations (FAO) (3).

15. In principle, once the project is prepared, its likely results should be independently and critically examined or evaluated, always taking into account the communities concerned and the given environmental conditions. In this way, the evaluation process would be based on the project plan, but would also include possible new information, if certain data were considered inaccurate or assumptions incorrect. If a project is to be financed by an international lending organization or by a bilateral aid agency, the external lender while understandably insisting on a thorough evaluation, should closely involve the national, subregional or regional partners in the early stages of the project. Above all, this period is intended to determine the economic and financial viability of the project, but while this has always occupied an important place in

project design, equal emphasis could now be given to the project's viability in terms of the ecosystem, society, etc.

16. It is clear that all planning and analysis of a project should primarily consider the best interests of the beneficiaries and therefore the implementation or execution, which directly affects the interested parties, is the most important stage in the project cycle. The implementation stage naturally depends on the overall duration of a project and the investment involved. Its duration should reflect not only material factors, but also how quickly the interested parties adapt to the project and above all how much the project contributes to the related programme. Generally the life of a project should not be decided solely on the basis of financial or economic analysis from the financial backers or according to a time limit, but should be related to a principal aim of development.

17. Last comes the final stage of the project cycle, the stage of retrospective evaluation when a systematic examination of all the reasons for the success or failure of a project should be undertaken in order to provide lessons for the future. Out of this retrospective evaluation, carefully researched recommendations should be drawn up for improving the validity of each aspect of the project's design. This would make for reviewing plans for projects already underway and for planning future projects more effectively.

2. Fundamental aspects which have been overlooked

18. Two recent enquiries into projects financed by the World Bank and UNDP have highlighted certain inadequacies in the orthodox framework for the design, implementation and evaluation of agricultural projects (4). These inadequacies touch on a number of fundamental aspects which have been overlooked and which can be found at the root of the problems experienced by agricultural projects, namely:

(a) A suitable framework

19. The fact that these projects are often limited in time and space and are not carried out in a suitable framework. As a result, they do not define all the aspects of development which must be addressed in order to improve an overall situation within a specific pre-allocated budget.

20. Indeed, until now, the majority of agricultural and rural development projects at regional and subregional level have been designed and executed on an isolated or ad-hoc basis, in response to short-term emergency situations. They often bear no relation to other sectors or the related programme, and are not integrated or even compatible with the sustainable and balanced development of the social, economic and ecological environment. As a result, they are likely to fail. Once their term has been completed or their funding dries up, these projects die a natural death.

21. If anything, the ways of assessing the profitability of the projects have been aimed at identifying and quantifying the combined financial and economic costs and benefits. Basically, the calculation of such costs and benefits has always focused on:

(a) The assessment of the project's financial returns, usually without reference to the rural community, and only at the level of the State - or region or subregion - and based on an examination of State finances (capital, debt, balance sheet, sources of funds, ratio calculations, etc.);

(b) The assessment of economic returns, without examining the overall economic situation, with or without the project; and the calculation of real prices, without allowing for taxes and subsidies;

(c) Cost adjustment (without allowing a percentage for overvaluation of the local currency or using the standard conversion factor; in other words, if the local currency is overvalued, there is a risk of underestimating the cost in foreign currency); note that the cost of labour must be calculated in terms of the

opportunity cost for the economy. An underestimate of costs is also a common phenomenon, frequently caused by a badly prepared project-analysis; the analysts have often made mistakes when using their technical hypotheses to project the rates of reform. According to the same World Bank survey, in one project on deforestation by cash crops, it was estimated that by using more efficient technology, 80 per cent of the planned increase in cultivable land would be achieved in the first year and the remaining 20 per cent would be cultivated over the next four years. This was not the case and resulted in higher costs than had been anticipated;

(d) The assessment of the project's internal profitability rate (for example the rate which cancels out the discounted profit) and evaluation of sensibility analyses.

22. All these financial and economic considerations should normally determine the projects' impact on the related programme or the economic development of the country, region or subregion under consideration while seeking to establish:

(a) Whether the project makes the best use of the available resources;

(b) Whether the priorities of the Government have been taken into consideration; and

(c) The impact that the project will have on the balance-of-payments on income distribution or on food self-sufficiency and food security.

(b) Market research

23. The results of market research should form the basis and framework for the projects. In general, the choice of project has followed the choice of product. No serious consideration of a project should be undertaken unless all the commercial implications have been examined beforehand, in particular the possible effects of the project on the local consumer, and on prices and competition, especially with imported products.

24. Very often, the decision to undertake market-research for a project is prompted only by routine research into the financial returns which is, in most cases, only relevant to the funding agency. Such decisions should spring from the desire to find out more about the local target-groups who, being the majority, constitute the potential market, rather than be confined to the external market; this is even more important when dealing with projects which affect export products or cash crops; at this level, there is a strong tendency to neglect the local market.

(c) Administrative apparatus, institutions and management organization

25. These aspects should occupy an important place in project preparation and analysis. Many questions revolve around these aspects which often overlap and certainly play an important role in the carrying-out of projects implementation.

26. Indeed, administrative procedures are often inadequate and lead to delays in the implementation of projects; to these can be added the frequently-encountered problems of slow and inappropriate decision-making, poor systems of authorization for the disbursement of project funds, bad organizational arrangements, and mediocre coordination between the different bodies concerned. Sometimes, government structures deprive the project director of any real authority, and there is a complete absence of any involvement by the communities concerned.

27. All this is often due to the virtual absence of government support for regional and subregional development projects in the agricultural and rural sectors; such a situation means a lack of genuine support

from governments (in counterpart personnel, office staff, etc.); a lack of linkage with related programmes (seen here in the context of lack of coordination); a lack of political support (prices, wage-incentives, etc.); lack of help from supporting institutions or agencies in terms of extension services, agricultural credit and marketing because their performance which is often very poor has not been assessed beforehand and poor maintenance of the technical equipment needed for the projects.

(d) Technical and social aspects

28. The socio-technical aspects which should determine, for example, the potential of the project zone, are often overlooked in projects, not to mention the impat on the people concerned and the technical resources required. Indeed an assessment of the project's effects on social and human conditions in the community, particularly those affecting peoples' concerns and aspirations (such as land-ownership problems, access to appropriate technology, etc.) has not always been given priority in project design and implementation nor have the possible effects on the ecological environment, etc.

29. For these reasons, the majority of projects reveal a lack of interest in the small-scale farming or rural communities - considered more passive than active partners - by the international staff assigned to those projects and who are not in a position to encourage a different approach, being interested only in large-scale farming. Generally, such projects, seeking support for existing research, extension, credit and marketing institutions share the same lack of interest in the various groups within an agrarian society.

30. In this case, the principal beneficiaries are the big landowners who have easier access to credit and can more readily negotiate advantageous marketing agreements. They profit most from the advice made available when the results of research are published.

31. In the same way, the technical progress that should ensue from the projects is seen essentially in terms of a mere transfer of technologies. As a result, the problems in this area are usually identified by those who already have the technology, but often have no experience of the project zones.

32. The proponents of technology transfer have been incapable of critically assessing what appropriate technologies would be needed and have failed to evaluate their effectiveness in solving problems as actually perceived by the various groups among the people concerned. In fact, many technical problems, especially in organization and management, cannot easily or quickly be solved through external intervention.

33. Finally, new agricultural techniques are developed in research establishments where management methods and physical conditions are usually quite different from those in Africa. In Africa, the agricultural holdings are small and planned objectives rarely have the desired results for small-scale farmers who produce very little food or who remain landless.

(e) Environment

34. As far as aspects relating to the environment are concerned, ecological factors are often not clearly identified at the level of project design and execution; even now, the environment is not always given the importance it deserves in the design of agricultural and rural projects. For a long time the environment has even been considered an obstacle to development and this is why, for example, cash crop projects are often developed to the detriment of tropical rain forests and African ecosystems in general. Several hectares of forest have been destroyed to make way for the production of cash crops such as cocoa, coffee and vanilla which are not competitive, whose future is uncertain and whose world market prices are highly erratic and tend to be falling.

35. In other cases, notably on certain islands in the Indian Ocean, the projects are of subregional character and are planned in such a way that cash crops occupy the areas that are ecologically suitable for

food crops (at an altitude of 0 to 400 metres) while the shrubland and forest areas are given over to the traditional sector in which the great majority of the active population use the land for unprofitable and inappropriate subsistence farming. Thus the islands' ecosystems are disrupted. (5)

36. Another common form of environmental degradation which is often overlooked in project planning is the destruction or damaging of plant cover through overgrazing, overworking of the soil or deforestation. This exposes the soil to all sorts of rain and/or wind-related erosion. In fact, erosion is common in all of sub-Saharan Africa and without doubt, remains one of the most serious hazards. According to the World Bank report of November 1989, entitled "Sub-Saharan Africa: From Crisis to Sustainable Growth", in Ethiopia, a country with rampant population growth, the topsoil is being removed at the rate of 290 tons per hectare in places of steep gradient. In West Africa, there have been losses of 10 to 20 tons of soil per hectare, even on gentle slopes. (6)

37. With a few notable exceptions, African governments have worked in vain to combat soil erosion because soil conservation demands regular additional work on the part of the farmers who are often simply unable to do it.

38. In addition to all these phenomena contributing to the wastage of natural resources, there are also numerous large development projects in agriculture-oriented dam-construction for instance, which do not always take account of present and future climatic conditions and the impact on the ecological environment and natural resources, etc.

39. A quick study of two development projects undertaken by the organization for the Development of the River Senegal (OMVS) will serve to illustrate some of the above points - especially the failure to identify ecological and other factors accurately. (7)

B. An object - lesson from two dam-construction projects

40. From 1960 onwards, any farmland requiring irrigation was developed on the two banks of the River Senegal in Senegal and Mauritania. But as this river is deeply embanked and water had to be pumped up to the fields, a way was sought of damming the river course so that water would flow down to the crops.

41. It was envisaged that three dams would be constructed at Bakel, Cascas and Dagana. However, they could not have solved the main problem which was to control the flow of water and avoid the huge yearly fluctuations. Only a large dam would solve the problem. (8)

42. Therefore, in 1972, the three countries bordering on the river - Mali, Senegal and Mauritania - created the Organization for the Development of the River Senegal (OMVS), in order to regulate the flow of the river. The three main objectives were:

(a) To develop irrigated farming;

(b) To generate electricity for the countries concerned; and

(c) To guarantee year-round navigation as far as Mali.

43. Work began in 1981. The dam at Manantali was constructed in the territory of Mali on the main tributary of the Senegal, the Bafing. Its holding capacity is 10 thousand million cubic metres, although it is a relatively small lake dam by comparison with the dams on the Nile, where the volume of water is 15 to 16 times greater. The capacity of this dam should have made possible:

(a) Year-lround irrigation of 255,000 hectares of land between Manantalia and St. Louis;

(b) A permanent discharge in excess of 100 m³/second for navigation; and

(c) Annual generation of 800 GWH of electricity by the hydroelectric power station at the base of the dam.

44. A second dam with embankments on the two banks of the river between Diama and Rosso was constructed near the mouth of the river at Diama. It had large locks to prevent the penetration or backsurge of sea water upstream of the construction works during the dry season (similar to the flood barrier downstream of London on the Thames). In the past, as the lower course of the Senegal has a very gentle gradient, the effects of salt water used to be felt right up to Dagana, about 200 km in the interior. The combination of dam and embankments at Diama was intended to stop the penetration of salt water and also allow:

(a) The transfer of river water to Lake Guiers for a larger part of the year;

(b) A permanent supply of freshwater for the irrigated areas, townships and industries in the delta area; and

(c) Sufficient surface water to replenish Lake R'Kiz and L'Aftout-es-Sahel.

Characteristics of the Manantali Reservoir

	Next to the crest gate	At the maximum water level allowed when the reservoir is in service
Water level in metres (IGN)	208.00	187.00
Corresponding surface of the reservoir (km²)	477.00	275.00
Volume of water in the reservoir (m³)	11.3 thousand million	3.4 thousand million

Maximum useful volume = (11.3 - 3.4 thousand million m³ = 7.9 thousand million m³

Source: OMVS, 1986.

45. The dam at Diama was completed in 1986, and the one at Manantali in 1988. By the end of 1990, the reservoir was 65 per cent full. But the mere construction of dams has never automatically led to development. Therefore, the use of these dams should have been better planned, bearing in mind the original aims. (8)

46. Both dams together cost a total of CFAF 186 thousand million. A huge consortium of donors provided the finance, primarily Saudi Arabia and Kuwait, to the tune of 136 and 91 thousand million ECUs (European currency unit 1 ECU = 7 FF) respectively. The Federal Republic of Germany and France also contributed (73 and 55 million respectively) as did other Arab countries, including Iraq. (8) The resettlement of the inhabitants of the area flooded by the lake was planned meticulously and accepted by the people.

From the start, it was clear to all parties involved that they would need several hundred million ECUs more to finance the projects related to the dam construction, i.e., the electricity generating station, the works for making the river navigable and the irrigation canals.

Characteristics of the Diama reservoir shoreline
at 1.50 and 2.50 metres (IGN)

	Shoreline at 2m 50 (IGN)	Shoreline at 1m 50 (IGN)
Length of reservoir	360 km up to the region of Guede Boghe	380 km up to the region of Boghe Cascas
Width of reservoir	0.3 to 5.0 km	0.3 to 5.0 km
Internal surface area of reservoir	235 km²	440 km²
Volume of water stored	0.25 thousand million cubic metres	0.58 thousand million cubic metres

Source: OMVS, 1986.

47. But meanwhile there has been a deterioration in the climate (lack of rainfall, drying up of the land, etc.) thus raising two fundamental issues, namely:

(a) The impact that the development projects under the programme for the development of the river Senegal will have on the environment and natural resources of the Senegal river basin; and

(b) The impact that these projets will have on the social and economic well-being of the inhabitants of the Senegal river basin.

48. At present, the question is whether the Senegal River has any future as a navigable waterway. According to some experts, the dredging of a navigable channel and the construction of river ports would require huge sums of money which could not be justified by the relatively small amount of freight, not to mention the fact that the sea port of St. Louis where goods would be reloaded is silted up at present and would need a complete overhaul to meet modern requirements. (7)

49. Obviously the generation of electricity by hydropower stations is an option for the future, because at present almost all electricity production in the countries bordering on the Senegal river depends on oil. Recent developments in the Gulf and their subsequent effects on oil prices have shown how dangerous such dependence can be. The question is whether hydropower is the best solution or whether a new energy policy should be considered, given the fact that poor rainfall makes the flow of the Senegal river unreliable. (8)

50. An attempt has been made to answer these questions in the OMVS report concerning evaluation of the environmental effects of the planned development of the Senegal river basin. According to this report, one thing is clear: not only is the comprehensive evaluation of the environmental impact of the OMVS programme mostly negative, but also, these days few funding agencies would fund large-scale projects such as these. Micro-projects are now the order of the day. The "post-dam" studies say the spending must stop.

51. In the final analysis, according to the magazine, Development and Cooperation, No. 3/1991, the most important project for the future of the region is still irrigation. Before the dams were built, there were

more than 30,000 hectares of irrigated land in each of the countries bordering the river, and in Mali in particular. This figure should rise to more than 375,000 hectares; but, from the start, the planners believed that it could only be achieved in the long-term - the planning documents from the early 1980s mention a period of 40 to 100 years. (8)

52. Another example of a dam-construction project for hydroelectric purposes comes from the development of the Tatinga Falls on the island of Anjouan, in the Comoros Archipelago. Excellent feasibility studies were conducted by the funding agencies, but just as the project was about to begin, it was realized that the Tatinga river had run dry. The main reason was excessive deforestation upstream. Meanwhile it is the Comoros which must cover the cost of these "marvellous studies" which failed to consider all the ecological factors. (9)

II. POSSIBILITIES OF IMPROVING THE EFFECTIVENESS OF AGRICULTURAL AND RURAL DEVELOPMENT PROJECTS

A. The need for a suitable policy framework

53. By working with projects which had been designed and executed within a set general policy framework which placed particular emphasis on the environment and sustainable development, many errors could be avoided, especially those mentioned above. In other words, projects must be fully integrated into a comprehensive development plan and will then reinforce and complement a programme which already exists or is being designed.

54. Until now, many African countries have tried to undertake agricultural and rural development projects based on large-scale programmes like that of OMVS. Whether they have had a positive impact on the environment, natural resources and the social and economic well-being of the people is highly uncertain. Other projects are based on macroeconomic reform programmes advocated by the World Bank and the International Monetary Fund. Despite considerable care at the formulation stage, these programmes have too rigid an approach and are not always directed either towards closer regional cooperation or towards the protection of vulnerable and impoverished groups. Care must be taken to ensure that social, macroeconomic and agro-ecological policies all work together to catalyse progress in the agricultural and rural sectors.

55. At the moment, Africa does have a theoretical and empirical framework to enable projects and their respective programmes to be formulated correctly. The African Alternative Framework to Structural Adjustment Programmes for Socio-economic Recovery and Transformation (AAF-SAP) which has adopted in April 1989 by the Joint Conference of Ministers of Finance and Planning, and subsequently by the Assembly of Heads of State and Government of the OAU in July 1989 and focuses, to a large extent, on the socio-economic recovery and transformation of Africa. (10)

56. To operationalize this alternative framework, a number of appropriate policy instruments together with modalities for their application have been prepared by ECA and proposed to African countries. They include a system of multiple exchange rates, differential interest rate policies and selective credit control and price support policies for achieving food self-sufficiency. (11)

57. Together with these policy instruments, AAF-SAP is recognized as a consensus between African countries and their major bilateral and multilateral development partners, more specifically the Bretton Woods Institutions. Both the IMF and the World Bank acknowledge that adjustment can only go hand-in-hand with transformation. Accordingly, in the long-term perspective study carried out in 1989 on "Sub-Saharan Africa: From Crisis to Sustainable Growth", the World Bank recognizes this fact categorically and undisputably as did the Maastricht conference on Africa organized in July 1990 in the Netherlands. (12)

58. That having been said, AAF-SAP seems to be a frame of reference well suited to the designing and the implementation of subregional and regional development projects. It raises hopes for Africa by presenting appropriate policies and measures that should enable the countries of this continent, not only to adapt themselves to a changing economic situation, but also to take the necessary action for the recovery and/or the transformation of their economies without, however, neglecting sustainable development and the protection of the environment.

59. Other frameworks or structures exist that have often emanated from supreme African legislative organs. A case in point is the regional conference of African Ministers of Agriculture which met at Yamoussoukro, Côte d'Ivoire, in 1986 and adopted a plan of action for African agriculture based on an in-depth study conducted by FAO in cooperation with African ministries of agriculture. (13)

60. This plan deals with the national, subregional and regional development of African agriculture over the next 25 years. In essence, it advocates a fundamental change in policy structure, priorities and national planning with a view to developing the food and agriculture sector, substantially improving the situation with regard to inputs, incentives, institutions and infrastructural facilities, implementing strategies for the reclamation of land and soil protection and providing African Governments and farmers with dynamic international support.

61. Finally, mention can also be made of the Den Bosch Declaration and Programme of Action emanating from the FAO/Netherlands Conference on Agriculture and the Environment which was held at S-Hertogenbosch, the Netherlands, from 15 to 19 April 1991, as well as the FAO follow-up project to this conference which takes the form of a programme providing a framework for international cooperation in agriculture and sustainable rural development. [1]

62. It should be noted that such seminal documents as AAF-SAP and the African Charter for Popular Participation in Development and Transformation and even the Programme of Action of the World Conference on Agrarian Reform and Rural Development reflect the Yamoussoukro Plan of Action for African Agriculture. In other words, they provide a working framework which could be of immediate use as a guide for designing and implementing subregional and regional development projects in the agriculture and rural sector with particular stress being laid on the environment and sustainable development.

63. Obviously, most initiatives aimed at transforming the agriculture and rural sector in African countries must come from the Governments themselves. Their intervention, however, should bring about changes that foster the introduction of new ideas and technologies and promote the provision of training and services at the subregional and regional level without neglecting the major beneficiaries in the rural areas.

64. In greater awareness of the role of governments than of the structure of farming and rural societies, development activities have often been confined merely to the ambit of the specific ministry dealing with a given project. Often, account has not been taken of the priorities and strategies which directly affect the potential of a specific project to make a valid contribution to agricultural and rural development as a whole.

65. It would therefore be appropriate to analyse government strategies and policies in order to see the extent to which they can influence project design, determine the economic viability of programmes and shape the sharing of project benefits among all members of society, particularly rural communities. AAF-SAP and the other Plans mentioned earlier can adequately assist in achieving these objectives.

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[1] Report of the FAO/Netherlands Conference on Agriculture and the Environment, S-Hertogenbosch, the Netherlands, 15-19 April 1991.

66. There are other possible ways of enhancing the effectiveness of subregional and regional development projects in the agriculture and rural sectors which focus not only on a suitable policy framework but also on measures aimed at:

(a) Improving market studies

67. Market studies should take place within a properly defined framework that is well targeted at satisfactory local and external outlets. The market must be large enough to absorb the products of the planned project.

68. If the project aims to produce for export, the specific conditions of the international market with regard to preferential treatment, long-term contracts, quality preferences, competition and other factors must be analyzed.

69. Domestic and external pricing policies must be comprehensively analyzed, debated at length or substantially modified during project implementation. Market studies must be based strictly on local market potentials. In other words, it should be integrated into the ancillary or development programme and fall within a properly circumscribed framework.

(b) Improving and strengthening project linkages with ancillary programmes or other sectors

70. To illustrate this, take the example of an agricultural extension project concerning a specific subregion. In such a case, the project may be linked to a development objective or ancillary programme such as the enhancement of food production within a properly defined framework.

71. The immediate objective of the project could relate to the training of extension officers, the improvement of administrative procedures or planning methods, the introduction of a system for controlling local agents, the training of farmers, the provision of support to sectoral or subsectoral or training for women or youth organizations. All these immediate objectives aim at development or an ancillary programme relating to the increase of food production.

72. Rarely can one project cover the entire range of immediate objectives or possible measures to be taken within a given ancillary programme. In order to make the best choice among the various immediate objectives possible, an in-depth analysis should be conducted on the ancillary programme, the scope of activities planned, the magnitude of financial resources, the expertise of national staff and existing general policy constraints.

73. Project formulation will accordingly require a change of orientation and care must be taken to keep away from the current conception of placing emphasis almost exclusively on the project objective, inputs and activities alone. Benefits will accrue to the extent that the immediate objective of the project and its implementation are related to those of the ancillary programme as a whole. This would clarify the scope and nature of activities carried out under the project and the inputs needed in order to attain the development objective.

74. Still within the example of the agricultural extension project, it would also be important to consider the following intersectoral linkages which directly relate to the environment, the family, the community and society as a whole.

(a) Among other things, the linkage of the project with the general level of education among the farming population will affect the selection of the means of communication, the capacity to participate in research development activities, the attitude of educated youth towards the farming profession and the extent to which rural women can be persuaded to participate in the improvement of rural society;

(b) Regarding the project linkages with health and nutrition, it should be observed that the health of the people is in part related to the availability of food and of water, not only for sanitation but also for livestock raising and irrigation. Measures to protect human and animal health can be indispensable to the adoption of new ideas in farming and, as in the case of education, they can also be a way of securing the support of the local community before tackling the problems of farming itself;

(c) The linkages with the spatial distribution and density of the population will determine how extension networks are designed and service centres located. Existing migration patterns and data on fertility rates will indicate the future characteristics of the rural population and such information can be used for long-term planning;

(d) Linkages with agro-based industrial prospects, planned employment capacity and details on local manufacturing potential are also factors that deserve to be taken into consideration; and

(e) Equally important in the design and implementation of projects are the linkages with farming society or the environment, any extension operations, existing farming systems, the systems of land ownership, domestic economic data, attitudes to change, environmental and cultural characteristics, local organizations and the social stratification of people by politics, wealth and income.

(c) Effective project management, improvement of the administrative apparatus and government support

75. The idea of effective project or programme management is based on participation. Indeed, experience has shown that such management could be entrusted to decentralized local administrative agencies, communities or non-governmental organizations directly involved in the project. The centralized technical agencies should only provide advice, support and equipment to projects managed on a decentralized basis. As an illustration a World Bank report of 1989 on the Rural Piped Water Programme in Malawi has it that this is one of the most successful water supply programmes in Africa and could well be replicated in other African countries. (14)

76. This programme is based on strong popular participation with limited but well-defined State involvement. It began modestly with techniques that were easily understood and maintained by the population and then was gradually expanded in light of accumulated experience and the lessons learned about programme design and the use of appropriate technologies. The success of the programme comes from the fact that the State assumed responsibility for training the community members who worked on the programme. It also provided the seed money, set standards and assumed technical responsibility for hydrological surveys, project documentation, provision of equipment and the monitoring of the system.

77. In this effort at decentralized management, women's participation had pride of place since, in Africa, women play a more active role in agriculture than anywhere else in the developing world. In the case of the rural pipe water programme, women provided more than half of the voluntary labour required to implement the programme, and more than two-thirds of the members of the committee responsible for maintaining stand pipes were women. Ten per cent of the planning committees, which decide on the assignment of responsibilities and planning, and 10 per cent of the repair teams were also women.

78. Wider powers must be entrusted to people managing the project: they must have every latitude for modifying the activities implemented and changing the inputs to match the situation as it occurs. Less stress should be laid on achieving immediate results and more emphasis placed on what should be achieved in the long term, on the strengthening of peoples' capabilities and other such factors that cannot be measured in the short term. Project follow-up and evaluation requires more subtle methods, and beneficiaries should participate in evaluating the impact of the project and the programme.

79. The proper functioning of programmes or projects, from the viewpoint of administrative efficiency, requires an administrative mechanism which functions properly and which can provide the coordination, leadership and support required. Hence, there should be horizontal integration, particularly at the village and community level in order to maximize the synergy between the various effects of the project. In the rural piped water programme, success encouraged public health officials to institute complementary health programmes that ensured that the improvement in water supply had tangible effects on the health situation.

(d) Protection of the environment and rural communities

80. While particular emphasis must be given to the environment and sustainable development, four main interrelated factors deserve consideration and should be given very special attention in the formulation of subregional and regional development projects in the agriculture and rural sector. These are climate, living and non-living natural resources, the agro-system and farming systems and technology.

81. Indeed, the influence of climate, which is responsible for soil formation and for determining the living environment, is often neglected in development-project analysis even though, more than any other factor, it is responsible for the type of agrarian life or farming environment. It can all too easily be forgotten that most African countries are situated in a stretch of land limited to the north by the Tropic of Cancer and to the south by the Tropic of Capricorn, in humid equatorial, dry tropical and monsoon zones. This fact alone explains the vast differences between the initial conditions faced by African countries and the pre-industrial development phase experienced by the rich countries during the last century.

82. In his book on the effects of weather on economic development, Kamarck demonstrates how necessary it is to make far more substantial development efforts in the tropical regions than are made in temperate regions in order to achieve similar results. (15)

83. The importance of natural resources from the viewpoint of sustainable development is beginning to be duly recognized in Africa. The main characteristics of natural resources lie in their potential use. This is basically a dynamic and changing concept which is determined by the pattern of mankind's needs, his technology and the choices made in order to meet those needs. In this regard, natural resources constitute the basis of the production system.

84. It can therefore rightly be emphasised that various natural resources are interdependent. Because of the linkages between them, the changes made in some may have repercussions on the others. Studies on the overall situation are therefore indispensable because nature is a gigantic living organism and anything affecting one of its elements changes its balance by equally affecting the other elements.

85. The development of one type of resource often enables another to be developed, as in the case of deforestation or reforestation where the repercussions can influence the climate, the water cycle, soils, plants and animals. Care should be taken not to disturb the natural balance, because the same deforestation can have the effect of creating new deserts, and tampering with nature's own controls can lead to the proliferation of predators or parasites.

86. It is highly possible that natural resources, even when they have taken relatively stable form, undergo changes over a given period. In many cases, the resources might be changed by natural processes. In contrast, all natural resources are susceptible to change by man who is, in every age, aware of their existence and uses them as he will. Should he use them wantonly, he runs the risk of destroying them and any negligence may well have disastrous consequences.

87. If we take the specific case of soil, soil fertility and water, they appear to be the most important bases of agricultural production and rural development. Their development and use should be conducted carefully given the fact that in Africa very serious cases of erosion and leaching are occurring. Rainfall

varies considerably and unpredictably. In some places, there is too much and it is torrential while in others, there is too little, resulting in chronic and acute water shortages.

88. Hence, the need for studies that would lead to the planning and large-scale development of river basins to save and regulate water resources and to control floods: and for irrigation and drainage methods and practices to improve water use and management. Very often, this is what applied research and training involves.

89. In most countries, there is still vast potential for irrigation development by which crop yields might be increased. The only problem is the field work and evaluation of available water resources as to whether in practice they are suitable for agricultural use. This is why studies have to be conducted beforehand to ascertain the actual and continued existence of surface and underground water.

90. The high rate of evaporation results in growing salinity in irrigated soils unless the water is carefully controlled and drainage facilities (which happen to be very costly) are available. This leads to consideration of related areas which form an integral part of water resources development, namely the preparation of topographic and aerial maps, applied geology, irrigation research, the drying of swamps and soil improvement, studies on soil salinity and alkalinity, rural water supply and the desalination of salty water.

91. Accordingly, the study and knowledge of natural resources, particularly those directly affecting agriculture (soil, water and forest) as well as their possible variation and reciprocal relations or influences must be given pre-eminence in project preparation.

92. The agro-system happens to be the oldest known ecosystem that has been studied and set up by rural folk. Once plants and animals were domesticated, it became vital for farmers to secure the best returns from their lands by rotating their crops as necessary, conserving humus and recycling organic nutrients through agro-pastoral balance. Since the forest also provided part of the resources of agriculture, mention can be made of sylvo-agro-pastoral balance or SAP as a future of properly managed farming.

93. In fact, the agro-system is an entire biogeocenoses which is incorporated into the agricultural system, in its turn related to a food chain within a defined region or ecoregion. (16) The agro-ecosystem unit is usually the farm whose size varies widely and ecological organization depends on the farming plan established by the farmer. This involves the selection of species, crop rotation, manuring, carbon recycling and organic elements left by cattle in their droppings over the range. Having said that, project preparation should strictly take the sylvo-agro-pastoral balance into account.

94. Systems of farming should be considered in the preparation of projects and studies. They should be perceived integrally rather than as isolated systems since they reflect an integrated response to the environment, the needs of the agricultural family and division of labour and to the social organization in force. Historically, the farming systems are the main agricultural types which succeeded each other during the development of the human population: harvest, extensive cattle rearing, farming on patch soil (often long and forest fallow), extensive arable system (ploughing and short fallow of weed), irrigation or dry farming system, enclosed agricultural/livestock self-sustaining system (animal as driving force and producer of fertilizers) open intensive agricultural system (tractors and chemical fertilizers).

95. For instance, in the humid forests of West Africa, coconut, cocoa and perennial plants such as cassava, yams and bananas are cultivated using relatively rudimentary techniques that necessitate man's effort and the use of simple tools. Harvests are guaranteed by the simultaneous farming of varieties with varied needs in humidity and soil quality and which are resistant, in various degrees, to drought, wind and parasites. Incomplete sowing and insufficient weeding due to the limited number of tools that the African farmer has at his disposal, provide shade, protect plants and contribute to natural reafforestation. It is easier

to cultivate small isolated farms than extensive areas overgrown with natural vegetation; at the same time, this helps to check the spread of plant diseases.

96. At the moment, a farming system is a type of an agro-system extended to an ecoregion. It reflects the response of the rural agricultural household (main rural production unit) to climatic conditions, availability of natural resources and environment, through the use of techniques that have developed over the centuries. For instance, the technique which, over the years, has been used in selecting varieties of indica rice in the African tropical regions, shows how the best had been derived from local conditions.

97. In situations where the soil is poor or where heavy odds must be battled to obtain minimum yields, this plant has provided a well-adapted solution as a result of the height of its stalk above the water level, of its insensitivity to variations in soil nutrient and its late maturing after the rains. The plough designed, for instance, by the farmer in the savannah regions helps to preserve soil humidity and can be drawn by very ill-nourished cattle. Mention can also be made of the wheel to pump water, a hoe, a spade and a sickle. Rice cultivation in the rainy season is alternated with the cultivation of pulses, wheat and groundnuts during the dry season (17).

98. The preparation of projects should lay special emphasis on technology since it is both a means to generate new income and an instrument for socio-economic and ecological change. In most cases, increased productivity depends on the application of improved techniques that can be considered as know-how derived from scientific knowledge and incorporated in an object, a process or an activity.

99. Technology in rural development can be seen in the new variety of seeds, in new cultivation techniques or construction methods; it corresponds to knowledge needed in the management of a farm, in the organization of a cooperative union, or in the establishment of a primary health care system. Distinctions can be drawn between the "hardware" (visible products and machines) and the "software" (experience, education and organizational forms).

100. Though techniques play an essential role in the area of rural development, they are mainly associated with production and productivity problems, particularly, in agriculture. In this sector, there is always an opportunity to improve the management techniques of farms and the use of better cultivation practices, to use new varieties of seeds and cattle breeds, electrical and mechanical equipment, herbicides, pesticides and chemical fertilizers, to expand irrigated areas and manage water resources, and to adopt new methods for the processing, storage, transport and marketing of agricultural products.

101. However, the introduction of new techniques in the use of seeds and fertilizers for the cultivation of high-yielding varieties of cereal staples has increasingly led farmers, for instance, to abandon traditional farming methods. The use of chemical fertilizers, pesticides and energy (fuel) for irrigation increases needs in production factors whose acquisition is necessary, coupled with the cost of seeds; furthermore, since organic fertilizer-based agriculture had been generally neglected, dependence on industrial production increased. In another connection, it is necessary to learn techniques used in weeding, watering, thinning out and planting of seeds, and in the application of fertilizers.

102. If new techniques are to be fully used at current factor costs, more spending and working capital will be needed to acquire fertilizers and pesticides, traction power for tilling the soil, and manpower for weeding. Consequently, an invasion of parasites, a breakdown in the irrigation network or a drought period entail a loss not only of crops but also of capital. Effects of failures are increasingly felt and small-scale farmers, for fear of having to sell their land to pay their debts, are, in general, less enthusiastic to take the risks associated with any change in methods.

103. Indeed, the green revolution has increased production but it has failed to improve income distribution. Everyone admits that it is necessary to increase agricultural production and productivity, but

then Governments seeking to increase production by encouraging the cultivation of high-yield varieties must be aware of the effects of such a choice on their own domestic or subregional market and income distribution. (18)

104. Advantages of techniques recommended by the green revolution can be briefly summarized as follows: increased yield (particularly of wheat) to twice that of traditional varieties; shorter cropping cycles make it possible, in rice cultivation, to economize water, and, in the case of wheat and rice, to reduce the quantity of water needed by a unit of area; shorter cycles make it possible to cultivate many crops, thereby, economizing land; many crops increase manpower demand per unit of area, and as a result, job opportunities in the agricultural sector (unless this positive effect diminishes due to mechanization); scale neutrality (as a result of the possibility to use less of such inputs as of seeds, fertilizers, pesticides and water) makes it possible to easily disseminate techniques to small- and large-scale farmers.

105. Preference for high-yield varieties highlights the relations that can exist between techniques, on the one hand, and the structure of the society and economy, on the other hand. It was clearly proven that unequal revenue in the rural sector has increased during the period corresponding to the introduction of new techniques as well as land concentration, the number of farmers without land and employment, and that the living conditions of the poor rural population have worsened.

106. Extensive research was conducted to determine if, and to what extent, the new techniques were responsible for these trends, and what was the contribution of other factors such as increased population, government policies, imperfect markets and structural problems. It is not yet possible to give clear and generally accepted answers to these questions; some common conclusions have been reached, one of which is the importance given to rural development targeting the poor sectors of the population.

107. Having limited credit facilities, limited technical knowledge and means of production the poor cannot take risks or innovate as easily as those with more land and capital. In the absence of Government intervention, the large-scale farmers who are more prosperous and educated innovate first and then farmers of the intermediate group follow suit. The poorest groups only follow much later unless the Government intervenes in their favour.

108. Land ownership encourages investment. At the same time, it is the main factor that determines the capacity to borrow. It is necessary to have ready cash so as to buy necessary production factors, as well as to choose the most favourable moment to buy or sell and to take risks. Educated farmers have easy access to information on new techniques, Government services and institutionalized credit facilities. In other words, if scale neutrality is possible at the level of techniques per se, the same does not apply to institutions with which the farmers deal.

109. It has therefore been said that new techniques favour land owners. Since Governments are essentially interested in increasing agricultural production, they have paid more attention to technical developments which have favoured land owners. It has been amply proven that it is easier, administratively, to deal with a small number of large-scale farmers than with a multitude of dispersed small-scale farmers. Civil servants also tend to take account of the economic and social status that large-scale farmers enjoy in their local community, more so as they often have family or caste relations with them.

110. Extension workers have objectives to accomplish, for example, concerning the area to be cultivated by using high-yield varieties, or to be formed by providing techniques to a small number of large-scale farmers. "Capitalizing on the most powerful" was thus a common policy. From now on, "Capitalizing on the poorest" must become a productive objective and such an objective must be attained through projects, from their design to execution.

111. New agricultural techniques must be designed to meet the needs and living conditions of the poor rural population; it is possible to determine the characteristics of a desirable rural environment (increased productivity, increased job opportunities throughout the year and the equitable distribution of profit) and to plan research/development activities.

112. New agricultural techniques introduced in Africa are those that increasingly use non-renewable energy resources, in particularly fossil fuels for the manufacture of chemical fertilizers and pesticides, and are also used to power irrigation schemes and agricultural machinery. Most African countries have to import these resources whose prices on the world market have increased tremendously. (19)

113. The question of knowing whether a technique is useful in rural development or only worsens the situation of the rural poor, will be largely determined by the social set-up within which the new techniques are applied. Hence there is a need for a framework within which subregional and regional development projects must be integrated in the agricultural and rural sector.

IV. CONCLUSION AND RECOMMENDATIONS

114. The report just considered has tried to analyze certain deficiencies noticed in the classical framework of the designing, execution and assessment of agricultural projects. Essentially, these deficiencies concern:

(a) The fact that the projects are limited in time and place and are not executed within a suitable development policy, and that such projects have no links with existing related programmes or other development sectors;

(b) Incomplete market studies whose only concern is the external and not the local market;

(c) The absence during project preparation of a clear identification of those ecological factors which play a vital role and which it neglected, result in a deterioration in the ecosystem as a whole;

(d) The lack of interest in small-scale farmers and the nation that the technical progress channelled through the projects is essentially considered as a mere transfer of technology; and

(e) The absence of Government support, coupled with inadequate administrative procedures, poor management and lack of coordination, and often a poor calculation of the costs, etc.

115. In order to illustrate some of these deficiencies, the report mentions some examples of projects designed which are more or less being carried out in places on the African continent. This is the case in particular with the dam construction projects in West Africa implemented by the Organization for the Development of the Senegal River (OMVS) and the hydroelectric project in the Anjouan island in the Comoros.

116. These projects, in spite of their excellent feasibility studies at the theoretical level, have not always taken account of ecological factors considered vital today.

117. On the basis of these established facts, possibilities to increase the effectiveness of subregional and regional development projects in the agricultural and rural sector, with special emphasis on problems relating to the environment, not only concerning the socio-economic and human aspects but also and above all, the ecology, are examined. Thus, the report stresses:

(a) The need for a framework such as the African Alternative Framework to Structural Adjustment Programmes for Socio-economic Recovery and Transformation (AAF-SAP), FAO regional food programme for Africa (AFPLAN) or the Plan of Action of the Regional Conference of African Ministers

of Agriculture, Yamoussoukro, 1986, etc., in which the projects are to be integrated; both AAF-SAP and the Programme of Action of the World Conference on Agrarian Reform and Rural Development, reflect the Yamoussoukro Plan of Action for African agriculture. This is a very useful operating framework which can directly serve as a guide for the designing and execution of subregional and regional development projects in the agricultural and rural sector and which recommends sustainable development while giving due consideration to environmental protection;

(b) That improved market research should be integrated in a well-defined framework, which properly targets satisfactory outlets at both the domestic and external levels. The market must be sufficiently large to absorb export products from planned projects. If it is a project for export products, it will be necessary to examine special conditions governing the world market such as preferential clauses, long-term contracts, quality preferences, competition, etc. A local and external pricing policy must be fully analyzed, lengthily discussed and considerably modified during project execution. Finally the market study must strongly rely on the potential local market; in other words, the study must be integrated in the related or development programme integrated in a suitable framework;

(c) Improvement and strengthening of links between projects and ancilliary programmes or other sectors;

(d) Rational management of projects through the participation and improvement of the administrative apparatus and genuine government support;

(e) Protection of the environment and rural communities. Here, four main interdependent factors which require studies and particular attention in the preparation of agricultural and rural development projects, were examined. These factors are climate, non-living and living resources, the agro-system and farming systems and technological resources.

118. This report, above all, maintains that the impact and the interaction of these factors should be taken into account in the preparation of projects; as a matter of fact, it is necessary to first evaluate the initial situation by drawing up an inventory of available resources: natural physical and biological resources, including plant and forest cover, as well as their quality and method of use; financial resources and finally, human resources, i.e. the participation level of the population concerned; climatic effects on development.

119. The combination of these basic factors makes it possible to determine the potential of sustainable agricultural and rural development. Therefore, projects must be designed on the basis of this combination, the mastery of which can be enhanced by modern methods and techniques.

120. All projects concerning Africa should take account of the fact that this continent is confronted by two major trends, namely population explosion and the rapid deterioration of the ecosystems, and that certain "renewable" resources are, indeed, not automatically renewed; for instance, the soil may become impoverished and even depleted as a result of uncontrolled farming.

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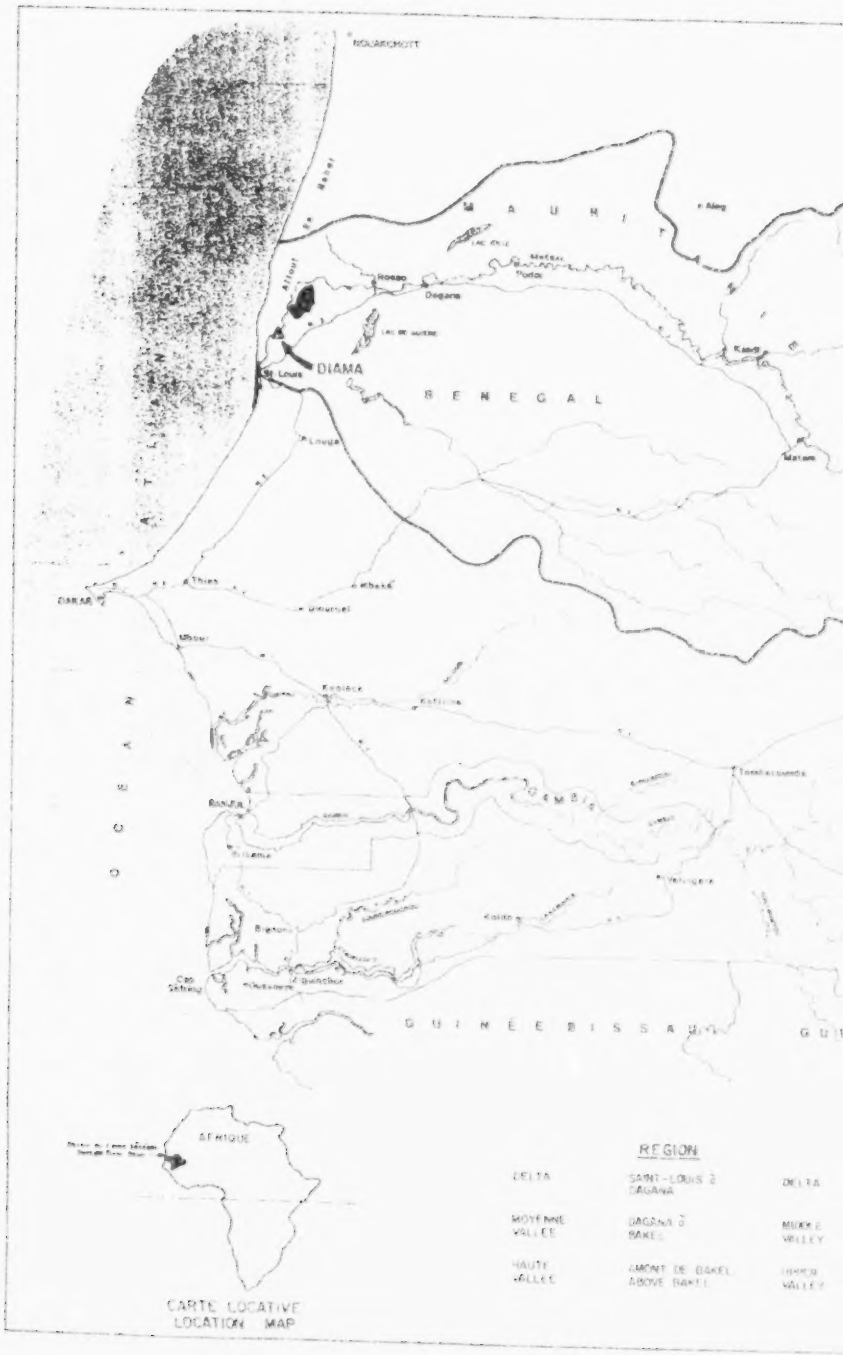
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MOYENNE VALLEE
DAGANA À BAKEL
MIDDLE VALLEY
HAUTE VALLEE
AMONT DE BAKEL
ABOVE BAKEL
UPPER VALLEY
CARTE LOCATIVE
LOCATION MAP

BASSIN DU FLEUVE SENEGAL
SENEGAL RIVER BASIN